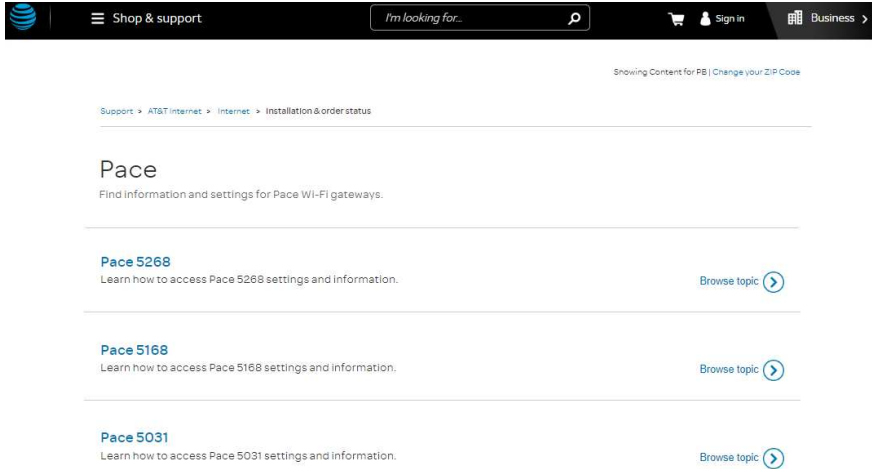



Exhibit 2

Claim	Analysis
<p>[1.1] A system for transmitting data from a general-purpose network to a subscriber data unit using pairs of copper wire such as lines serving subscribers of the conventional telephone system over a distance greater than that generally allowed by said subscriber lines, said system comprising:</p>	<p>AT&T makes, uses, sells and/or offers for sale a system for transmitting data from a general-purpose network to a subscriber data unit using pairs of copper wire such as lines serving subscribers of the conventional telephone system over a distance greater than that generally allowed by said subscriber lines.</p> <p>For example, AT&T provides modems and gateways (such as U Verse Pace 5031 NV, Motorola NVG589 VDSL2 and ARRIS 5268AC) to users for Wireless Access Network (WAN) connectivity. A modem transmits data (such as voice signals for telephone network and/or internet data) from a broadband and/or narrowband network (“general-purpose network”) to the user. The modem is connected to the network via a copper wires (such as connecting wires used for conventional telephone system). AT&T’s modem (such as U Verse Pace 5031 NV) supports Reach Extended Asymmetric Digital Subscriber Line Transceivers 2 (READSL2) ITU standard (G.992.3) Annex L to communicate with at least one of the network using pairs of copper lines of the conventional telephone system over a distance greater than that generally allowed by the subscriber lines.</p>  <p>Source: https://www.att.com/esupport/main.html#!/u-verse-high-speed-internet/topic_installation2-topic_gatewaysmodems-topic_pace</p>


AT&T Community Forums
Sign up | Sign in

Explore & discuss
AT&T Internet Equipment
I'm looking for...
Ask a question


AT&T < AT&T Forums Home < Internet < AT&T Internet < AT&T Internet Equipment < 5031NV User Manual

Spotlight:
[Visual Voicemail](#)
[Two PCs](#)
[Streaming Reminder](#)
[U-verse App](#)
[DIRECTV Equipment](#)

Let us introduce you to [AT&T Watch TV](#) and our [AT&T Unlimited & More Plans!](#)

Not finding what you're looking for? [Try asking the community a question!](#)

5031NV User Manual
Options


gargoyle1025
Contributor




Jan 10, 2015 2:49 PM

5031NV User Manual

I would like to download (from a safe source) the user manual for the AT&T (PACE) 5031nv router. I have looked many places online and cannot seem to find it. I would like to learn more about the router, especially for what the USB port on the back can be used.

Tags (1)
Tags: [5031NV](#)

Share this topic

Recommendations

[7550 User manual/guide](#)

[PACE 5268AC FXN manual](#)

Source:
<https://forums.att.com/t5/AT-T-Internet-Equipment/5031NV-User-Manual/td-p/4180882>

Page 5031NV Technical Specifications

Local Network Interfaces

4 port 10/100 Ethernet with auto-crossover (RJ-45)
IEEE 802.11b/g/n wireless access point

Broadband Network Interfaces

Integrated uDSL modem
10/100Base-T Ethernet WAN port

ADSL

ADSL 1, ADSL 2, ADSL 2+
T1.413 Issue 2, G.992.1, G.992.3, G.992.5
TR-067- and TR-100- compliant
ANSI and ETSI loops
Annex A and L support
Extended frames support
Cabinet mode support

Software Tools and Diagnostics

Zero-touch provisioning available via factory-preloaded configuration files
Simple Web-based user interface for easy configuration and diagnostics
Quick summary page with shortcuts to most commonly used features

Network Protocol Support

ATM UNI, UBR, VBRrt, VBRnt, CBR
Support up to four ATM PVCs in any configuration
IPv4, TCP, UDP, ARP, ICMP, IPv6 capable
DHCP client/server, DNS client/server, HTTP client/server
Single IP and multi-IP support
Multicast-static support for mapping public IP addresses
PPPoE, PPPoA, PAP, CHAP, RFC 2684/1483 Ethernet
Support up to four PPP links and up to four PVCs

NAT/PAT Support

Standard NAT/PAT between LAN and WAN
Automated NAT pass-through for LAN client-initiated VPN tunnels (IPSec, PPTP, L2TP, SIP, H.323, RTP)
Easy-to-configure NAT pass-through (pinholes) for common applications (games, servers, etc.)
DMZplus for automatic WAN IP assignment to a local computer
Supports most popular ALGs: HTTP, FTP, H.323, AIM, MSNAMES, DIABLO, IPSEC-IKE/ESP, IRC, MSN, PPTP, RTP, RTSP, and SIP

Standard Hardware Features

TR-068-compliant industrial design and LED indicators
Vertical placement via provided stand or horizontal desktop placement
External power supply with power on/off switch

Physical Specifications

Source:

<https://www.dslreports.com/r0/download/2229779~b03da298d2aad3a62ba3ec53b57d8f9d/5031NV%20Data%20Sheet.pdf>, page 2

Annex L

Specific requirements for a Reach Extended ADSL2 (READSL2) system operating in the frequency band above POTS

This annex defines those parameters of the ADSL system that have been left undefined in the main body of this Recommendation because they are unique to a Reach Extended ADSL2 service that is frequency-division duplexed with POTS.

For an ATU supporting Annex L, support of Annex A is a mandatory capability.

For an ATU supporting Annex A, support of Annex L is an optional capability.

Performance requirements shall only be defined for the mandatory non-overlapped transmit spectral masks. The optional overlapped masks should not be used in performance requirements.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 385

5.4 Application models

The application models for G.992.3 are based upon the generic reference configuration described in 6.1/G.995.1 [B1]. There are four separate applications models, one each for ADSL data service only, ADSL data service with underlying POTS service, ADSL data service with underlying ISDN service and Voice over ADSL service.

Two generic application models for G.992.3 exist. The application model for remote deployment with splitter is shown in Figure 5-4.

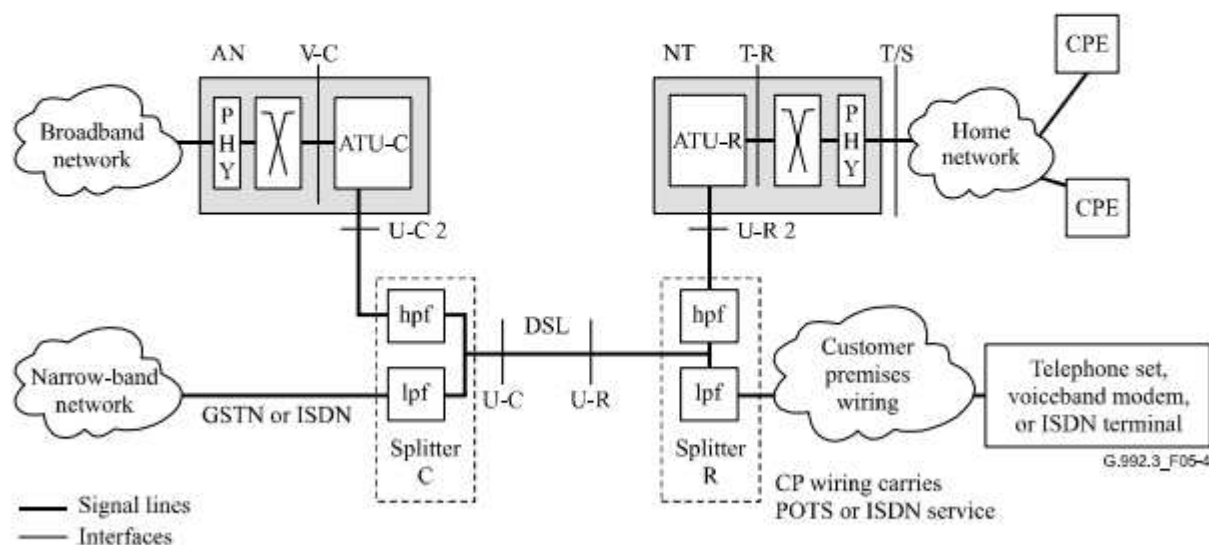


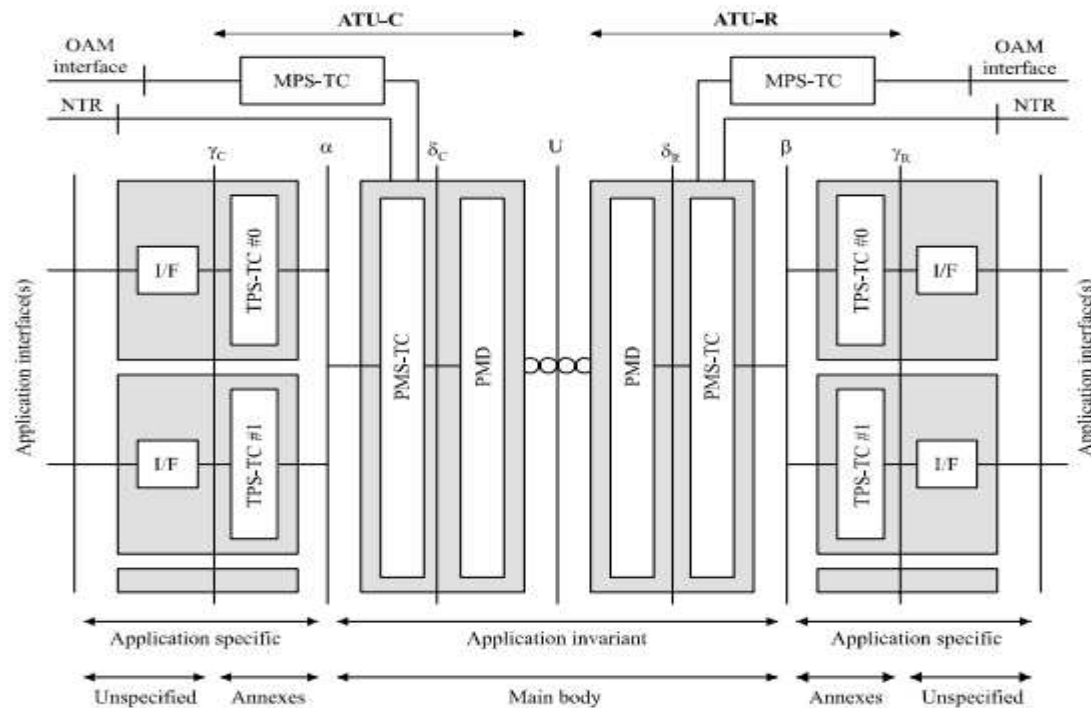
Figure 5-4/G.992.3 – Generic application reference model for remote deployment with splitter

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 12

5.1 ATU functional model

Figure 5-1 shows the functional blocks and interfaces of an ATU-C and ATU-R that are referenced in this Recommendation. It illustrates the most basic functionality of the ATU-R and the ATU-C. Each ATU contains both an application invariant section and an application-specific section. The application invariant section consists of the PMS-TC and PMD layers and are defined in clauses 7 and 8, while the application-specific aspects that are confined to the TPS-TC layer and device interfaces, are defined in Annex K. Management functions, which are typically controlled by the operator's management system (EMS or NMS), are not shown in Figure 5-1. Figure 5-3 provides a high level view that includes the management interface.



G.992.3_F05-1

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 9

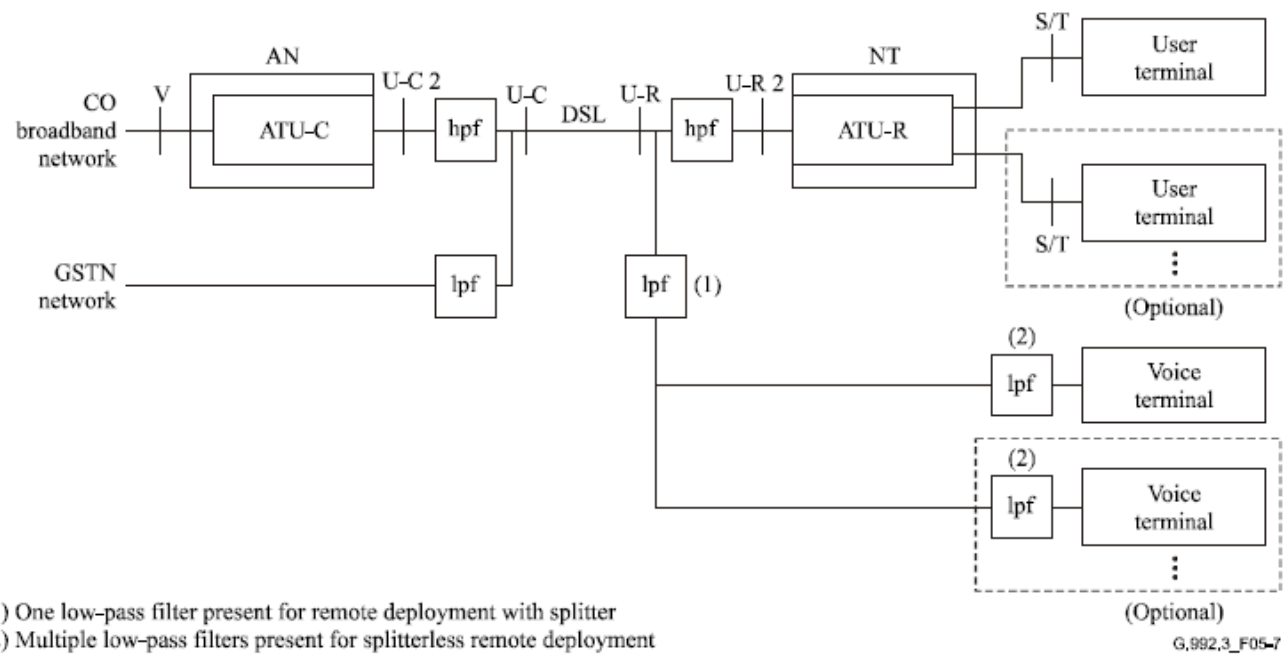


Figure 5-7/G.992.3 – Data with POTS service application model

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14

The transmit PMS-TC function accepts input signals from the data plane and control plane. As a data plane element, the transmit PMS-TC function accepts one to four input frame bearers from the TPS-TC functions. All transmit data plane input signals are synchronized to the local PMD transmit clocks. These inputs are conveyed to the receive PMS-TC function interface as depicted in Figure 7-1. Octet boundaries in the frame bearers and the position of most significant bits are maintained from the input interface of the transmit PMS-TC function to the output interface of the receive PMS-TC function.

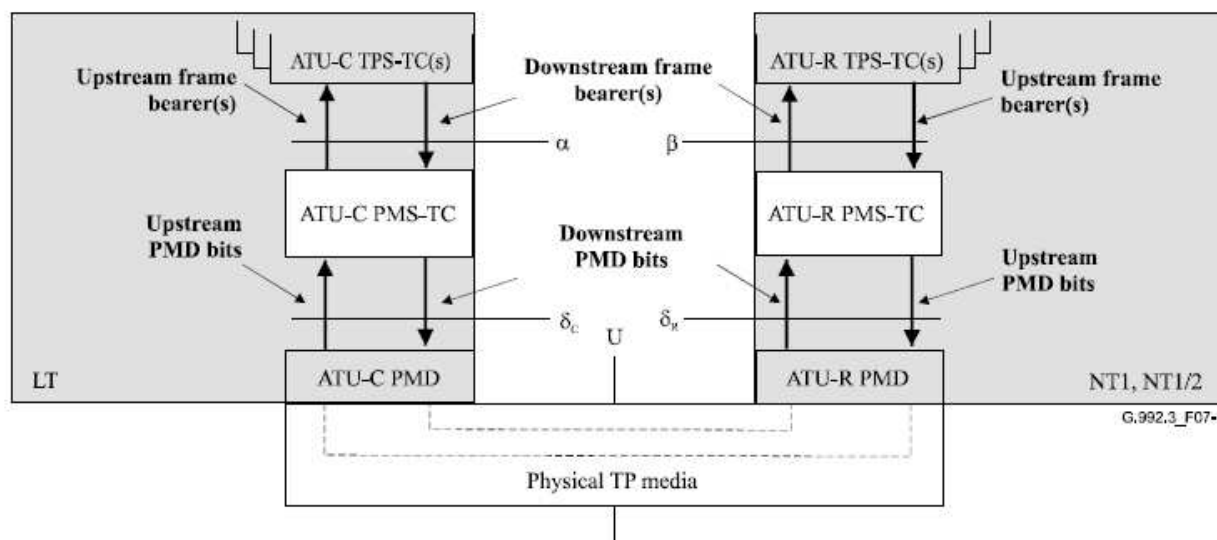


Figure 7-1/G.992.3 – PMS-TC transport capabilities within the user plane

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 22

[1.2] a general-purpose network-to-subscriber data unit interface, said interface receiving data

AT&T makes, uses, sells and/or offers for sale a system comprising a general-purpose network-to-subscriber data unit interface, said interface receiving data from a general-purpose network and formatting it for transmission to said subscriber data unit.

For example, the ADSL Transceiver Unit (ATU-C) at the broadband Central Office (CO) end is interfaced with the ADSL Transceiver Unit (ATU-R) at the Remote terminal end via the Digital Subscriber Line (DSL). The DSL

<p>from a general-purpose network and formatting it for transmission to said subscriber data unit;</p>	<p>Access Multiplexer (DSLAM) at CO side receives data from the broadband network and send it in the form of broadband (ADSL2) and narrowband (Plain Old Telephone Service (POTS)) at the subscriber end. AT&T's modem is connected to the DSLAM which is further connected to the PSTN network via the conventional telephone lines. The DSLAM acts as a network switch which collects the data from its different modem ports and aggregates their voice and data traffic into one complex composite signal via a multiplexing.</p> <p>8.13.1.2 Transparency to methods for separating upstream and downstream signals</p> <p>Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by defining a time period during which an echo cancelled transceiver can train its echo canceller.</p> <p>8.13.1.3 Implementation of service options for ADSL</p> <p>The initialization procedure described here is applicable to different service options. The subcarrier frequencies used for some signals vary depending upon whether the ADSL service is offered over a POTS or an ISDN service (as defined in Appendices I, II, or III/G.961 [1]) or as all-digital mode without underlying service. These subcarrier frequencies are, therefore, defined over a wide enough frequency band, such that the receiver can identify the transmitter state/signal, irrespective of the service option chosen.</p> <p>Source: https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105</p>
--	---

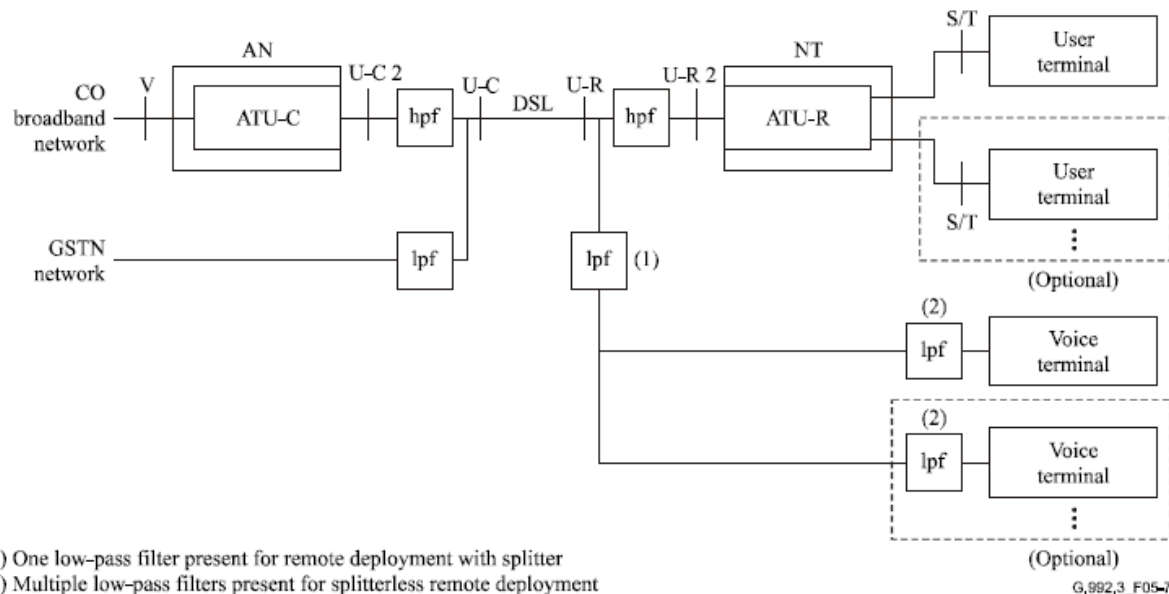


Figure 5-7/G.992.3 – Data with POTS service application model

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14

<p>[1.3]a first broadband transceiver connected to said interface, said first broadband transceiver unit receiving said formatted data from said interface,</p>	<p>AT&T makes, uses, sells and/or offers for sale a system comprising a first broadband transceiver connected to said interface, said first broadband transceiver unit receiving said formatted data from said interface.</p> <p>For example, the ATU-C (“first broadband transceiver”) receives the formatted data from the broadband network at the broadband CO unit. The ATU-C is connected to a broadband network and also connected to a GSTN (General Switched Telephone Network) core network via low pass filter to transmit data over DSL. The ATU-C receives high frequency (ADSL) and/or low frequency (POTS) signals from at least one of the network via the communication wires (such as copper wires and/or fiber).</p>
---	---

8.13.1.2 Transparency to methods for separating upstream and downstream signals

Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by defining a time period during which an echo cancelled transceiver can train its echo canceller.

8.13.1.3 Implementation of service options for ADSL

The initialization procedure described here is applicable to different service options. The subcarrier frequencies used for some signals vary depending upon whether the ADSL service is offered over a POTS or an ISDN service (as defined in Appendices I, II, or III/G.961 [1]) or as all-digital mode without underlying service. These subcarrier frequencies are, therefore, defined over a wide enough frequency band, such that the receiver can identify the transmitter state/signal, irrespective of the service option chosen.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105

The application model for splitterless remote deployment is shown in Figure 5-5. An optional low-pass filter may be included to provide isolation and protection of telephone sets, voiceband modems, ISDN terminals, and the ATU-R. The location of filters in all application model diagrams is intended to be functional only. The specific functions of the filter may be regionally specific. The filter may be implemented in a variety of ways, including splitters, in-line filters, integrated filters with ATU devices, and integrated filters with voice equipment.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 12

5.4 Application models

The application models for G.992.3 are based upon the generic reference configuration described in 6.1/G.995.1 [B1]. There are four separate applications models, one each for ADSL data service only, ADSL data service with underlying POTS service, ADSL data service with underlying ISDN service and Voice over ADSL service.

Two generic application models for G.992.3 exist. The application model for remote deployment with splitter is shown in Figure 5-4.

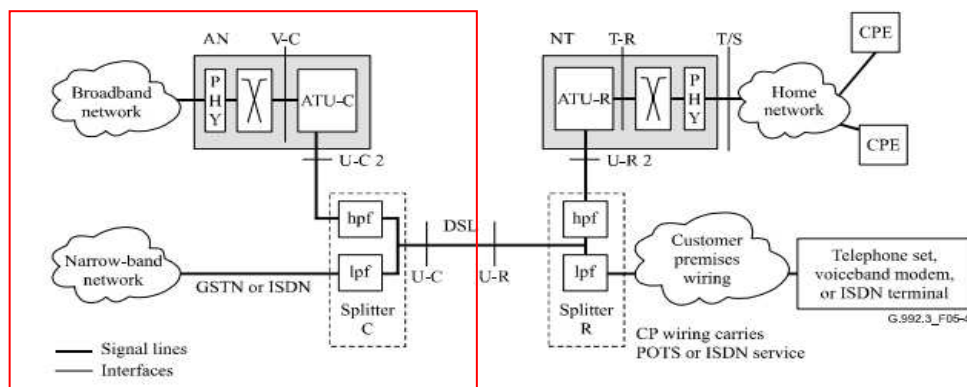


Figure 5-4/G.992.3 – Generic application reference model for remote deployment with splitter

Source:

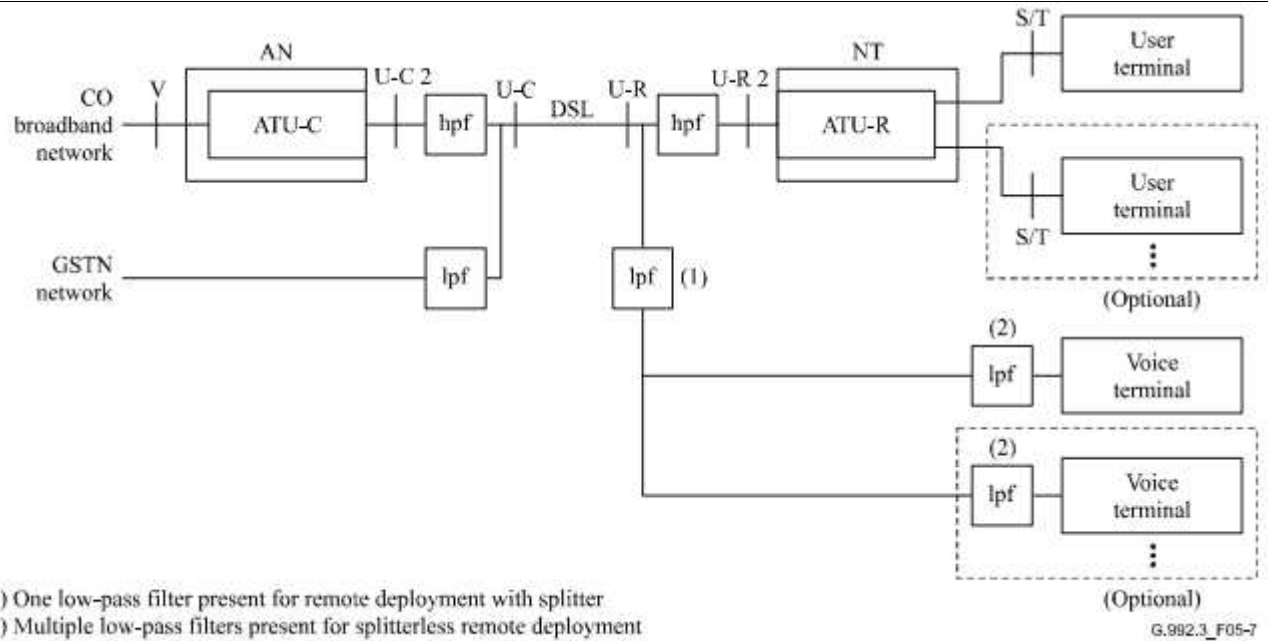
https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items
page 12

5.4.2 Data with POTS service

Figure 5-7 depicts the typical application model for delivering data service over G.992.3 with an underlying POTS service on the same DSL, showing reference points and attached equipment. In such an application, an ATU-R is part of the ADSL NT which will typically connect to one or more user terminals, which may include data terminals, telecommunications equipment, or other devices. The connections to these pieces of terminal equipment are designated S/T reference points. The ATU-R will not be directly attached to the U-R reference point but will be separated from the DSL by a high-pass filter element. Additionally, one or more voice terminals will also be part of the application model at the customer premises. These voice terminals may include POTS telephones, telephone answering devices, voiceband analog modems, or other devices. The voice terminals may be attached directly the U-R reference point or may be connected through a low-pass filter element per voice terminal (splitterless remote deployment) or may be connected through a common low-pass filter element (remote deployment with splitter). At the central endpoint of the DSL, the ATU-C will connect to the U-C reference point through a high-pass filter element. The ATU-C is part of the Access Node, which will typically connect to a broadband access network at the V reference point. Additionally, there will be a low-pass filter element attached at the U-C reference point to connect with the GSTN core network.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14



Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14

[1.4] a second broadband transceiver unit receiving said formatted data in a channel of one or more frequency division multiplexed signals transmitted from

AT&T makes, uses, sells and/or offers for sale a system comprising a second broadband transceiver unit receiving said formatted data in a channel of one or more frequency division multiplexed signals transmitted from said first broadband transceiver via a broadband communication link.

For example, the ATU-R (“second broadband transceiver”) is a part of the ADSL network which is connected to one or more user terminals, which include data terminals, telecommunications equipment, or other devices. The ATU-R receives high frequency (ADSL) and/or low frequency (POTS) signals from ATU-C over the DSL. The ATU-R at subscriber end receives the formatted data in a downstream (ATU-C to ATU-R) channel, consisting Frequency Division Multiplexed (FDM) signal, from ATU-C connected via AT&T’s modem over the broadband and/or narrowband network.

<p>said first broadband transceiver via a broadband communication link,</p>	<p>8.8 Modulation</p> <p>The modulator shall modulate a constellation encoder output data frame or sync frame (containing $NSC - 1$ complex values Z_i, $i = 1$ to $NSC - 1$) into a DMT symbol. The data frame can be taken from the data symbol constellation encoder (68 per superframe) as defined in 8.6. The sync frame can be taken from the synchronization symbol constellation encoder (1 per superframe) as defined in 8.7. For (short) initialization and diagnostics mode signals, the frame is defined in 8.13, 8.14 and 8.15.</p> <p>8.8.1 Subcarriers</p> <p>A DMT symbol consists of a set of subcarriers, with index $i = 0$ to NSC. The DMT subcarriers spacing Δf, shall be 4.3125 kHz, with a tolerance of ± 50 ppm. The subcarrier frequencies shall be $f_i = i \times \Delta f$, $i = 0$ to NSC.</p> <p>8.8.1.1 Data subcarriers</p> <p>The channel analysis (see 8.13.5) allows for a maximum of $(NSC - 1)$ data carriers to be used (i.e., $i = 1$ to $NSC - 1$). The lower limit of usable i depends on both the duplexing and service options selected. For example, for ADSL above POTS service option as defined in Annex A, if overlapped spectrum is used to separate downstream and upstream signals, then the lower downstream limit on i is determined by the POTS splitting filters; if non-overlapped spectrum with frequency-division multiplexing (FDM) is used, the downstream lower limit on i is set by the downstream-upstream separation filters.</p> <p>Source: https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14</p>
---	---

8.13.1.2 Transparency to methods for separating upstream and downstream signals

Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by defining a time period during which an echo cancelled transceiver can train its echo canceller.

8.13.1.3 Implementation of service options for ADSL

The initialization procedure described here is applicable to different service options. The subcarrier frequencies used for some signals vary depending upon whether the ADSL service is offered over a POTS or an ISDN service (as defined in Appendices I, II, or III/G.961 [1]) or as all-digital mode without underlying service. These subcarrier frequencies are, therefore, defined over a wide enough frequency band, such that the receiver can identify the transmitter state/signal, irrespective of the service option chosen.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105

5.4 Application models

The application models for G.992.3 are based upon the generic reference configuration described in 6.1/G.995.1 [B1]. There are four separate applications models, one each for ADSL data service only, ADSL data service with underlying POTS service, ADSL data service with underlying ISDN service and Voice over ADSL service.

Two generic application models for G.992.3 exist. The application model for remote deployment with splitter is shown in Figure 5-4.

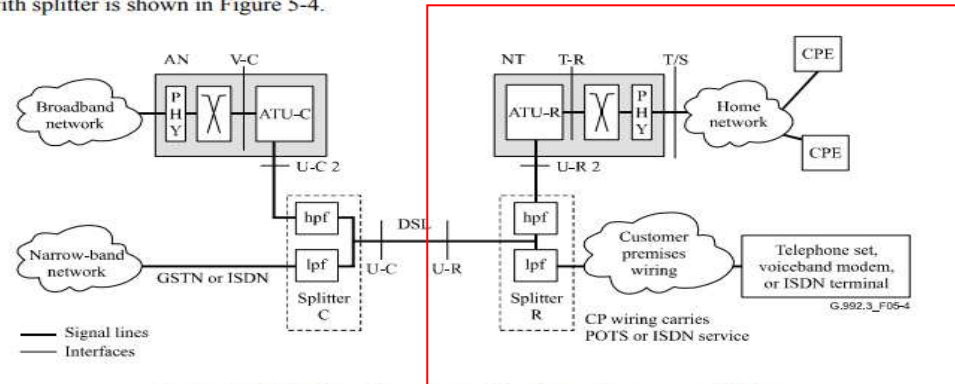


Figure 5-4/G.992.3 – Generic application reference model for remote deployment with splitter

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 12

[1.5] said second broadband transceiver removing said formatted data from said channel and transmitting said formatted data to said subscriber data unit via a subscriber line connected to said second broadband

AT&T makes, uses, sells and/or offers for sale a system comprising said second broadband transceiver removing said formatted data from said channel and transmitting said formatted data to said subscriber data unit via a subscriber line connected to said second broadband transceiver.

For example, a splitter at subscriber end separates the ADSL and POTS signals. These formatted signals are then transmitted to ATU-R via the subscriber line. The splitter divides the formatted signal into low frequencies for voice (POTS) and high frequencies for data (ADSL). The splitter is integrated into ATU, physically separated from the ATU and/or divided between high pass and low pass, with the low pass function physically separated from the ATU.

transceiver;	<p>3.36 splitter: Filter that separates the high frequency signals (ADSL) from the voiceband or ISDN signals; (frequently called POTS or ISDN splitter, even though the voiceband signals may comprise more than POTS).</p> <p>Source: https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 5</p> <p>8.13.1.2 Transparency to methods for separating upstream and downstream signals</p> <p>Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by</p> <p>Source: https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105</p>
--------------	--

8.8 Modulation

The modulator shall modulate a constellation encoder output data frame or sync frame (containing $NSC - 1$ complex values Z_i , $i = 1$ to $NSC - 1$) into a DMT symbol. The data frame can be taken from the data symbol constellation encoder (68 per superframe) as defined in 8.6. The sync frame can be taken from the synchronization symbol constellation encoder (1 per superframe) as defined in 8.7. For (short) initialization and diagnostics mode signals, the frame is defined in 8.13, 8.14 and 8.15.

8.8.1 Subcarriers

A DMT symbol consists of a set of subcarriers, with index $i = 0$ to NSC . The DMT subcarriers spacing Δf , shall be 4.3125 kHz, with a tolerance of ± 50 ppm. The subcarrier frequencies shall be $f_i = i \times \Delta f$, $i = 0$ to NSC .

8.8.1.1 Data subcarriers

The channel analysis (see 8.13.5) allows for a maximum of $(NSC - 1)$ data carriers to be used (i.e., $i = 1$ to $NSC - 1$). The lower limit of usable i depends on both the duplexing and service options selected. For example, for ADSL above POTS service option as defined in Annex A, if overlapped spectrum is used to separate downstream and upstream signals, then the lower downstream limit on i is determined by the POTS splitting filters; if non-overlapped spectrum with frequency-division multiplexing (FDM) is used, the downstream lower limit on i is set by the downstream-upstream separation filters.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 89

8.13.1.2 Transparency to methods for separating upstream and downstream signals

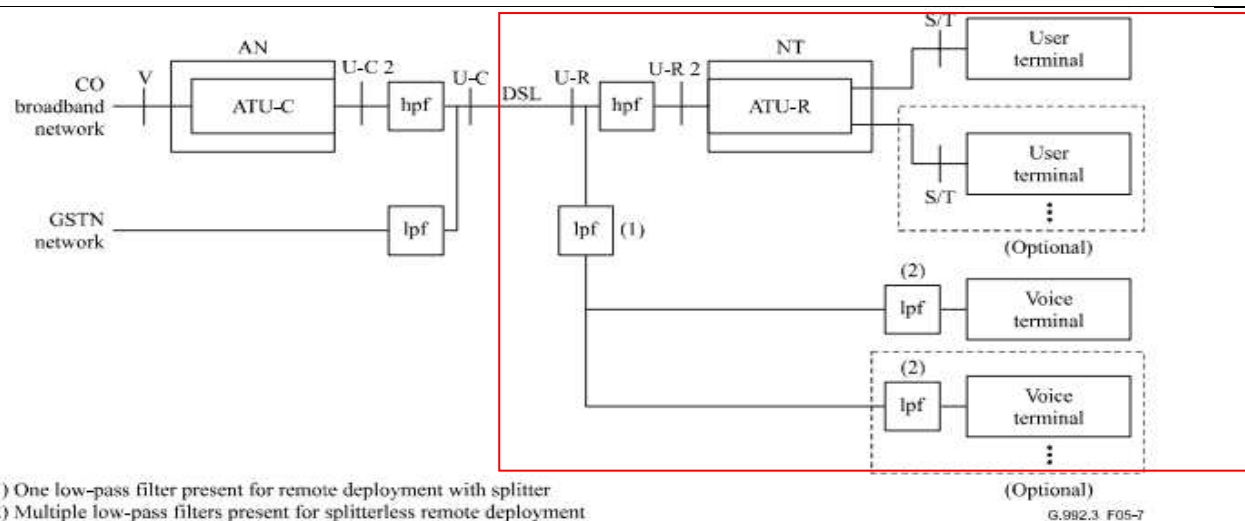
Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by defining a time period during which an echo cancelled transceiver can train its echo canceller.

8.13.1.3 Implementation of service options for ADSL

The initialization procedure described here is applicable to different service options. The subcarrier frequencies used for some signals vary depending upon whether the ADSL service is offered over a POTS or an ISDN service (as defined in Appendices I, II, or III/G.961 [1]) or as all-digital mode without underlying service. These subcarrier frequencies are, therefore, defined over a wide enough frequency band, such that the receiver can identify the transmitter state/signal, irrespective of the service option chosen.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105



Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 14

[1.6] and wherein said second broadband transceiver receives upstream data from said subscriber data unit via said subscriber line, said second broadband transceiver transmits said data in an upstream channel

AT&T makes, uses, sells and/or offers for sale a system wherein a second broadband transceiver receives upstream data from said subscriber data unit via said subscriber line, said second broadband transceiver transmits said data in an upstream channel of a frequency division multiplexed signal to said first transceiver, said first transceiver removes said data from said upstream channel and transmits said data to said interface.

For example, the ATU-R transmits an upstream (ATU-R to ATU-C) data through a channel, consisting FDM signal, to the ATU-C unit located at the broadband and/or narrowband CO via the subscriber line. The ATU-R sends a high frequency (ADSL) and/or low frequency (POTS) signals to the ATU-C over the DSL.

of a frequency division multiplexed signal to said first transceiver, said first transceiver removes said data from said upstream channel and transmits said data to said interface,

8 Physical media-dependent function

8.1 Transport capabilities

The ATU Physical Media Dependent (PMD) function provides procedures for transporting a bitstream over the physical medium (i.e., over the copper pairs) in both the upstream and downstream directions. The transmit PMD function accepts data from the transmit PMS-TC function and the receive PMD function delivers data to the receive PMS-TC function as shown (for the Data Plane) in Figure 8-1. The transmit and receive TPS-TC functions are specified in clause 6. The transmit and receive PMS-TC functions are specified in clause 7.

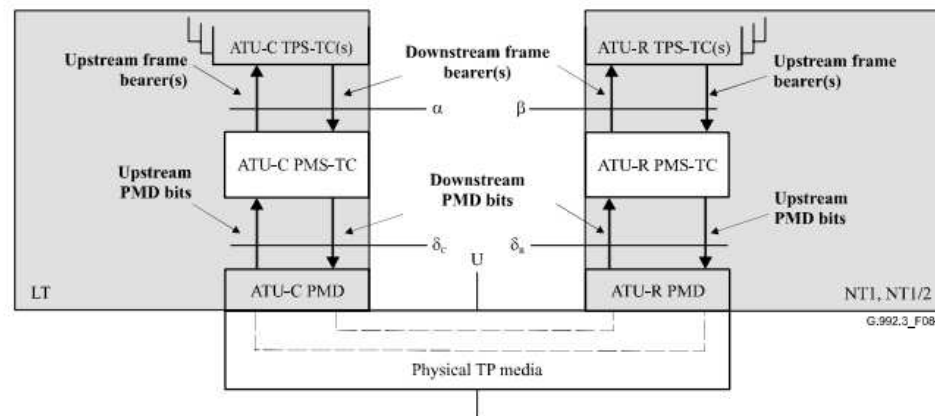


Figure 8-1/G.992.3 – PMD transport capabilities within the data plane

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 57

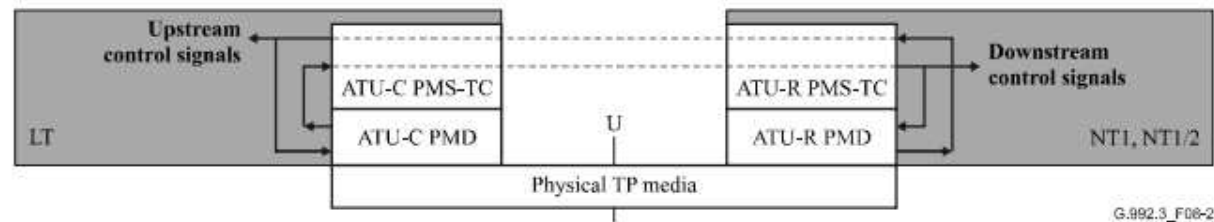


Figure 8-2/G.992.3 – PMD transport capabilities within the control plane

As a management plane element, there are no specific transport functions provided by the PMD function during normal operation. However, the receive PMD function provides management primitive indications to the local management entity within the ATU. Within the ATU, these management primitive indications result in control signals that are transported in the control plane using PMS-TC transport functions, as depicted in Figure 8-3. During initialization, the ATU transmit PMD function provides transport of some configuration parameters from the near-end Management Entity to the far-end PMD function.

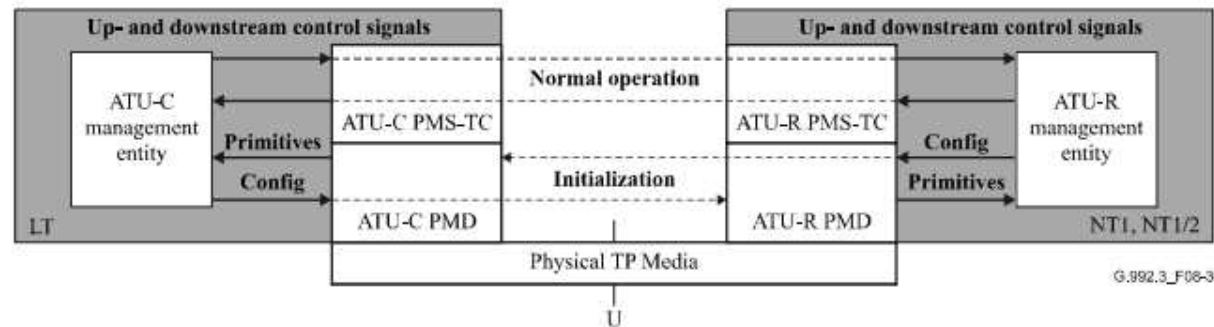


Figure 8-3/G.992.3 – PMD transport capabilities within the management plane

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 58

[1.7] said
interface formats

AT&T makes, uses, sells and/or offers for sale a system wherein said interface formats said data received from said first transceiver for transmission to said general-purpose network and said interface transmits said received

said data received from said first transceiver for transmission to said general-purpose network and said interface transmits said received data from said first transceiver to said general-purpose network.

data from said first transceiver to said general-purpose network.

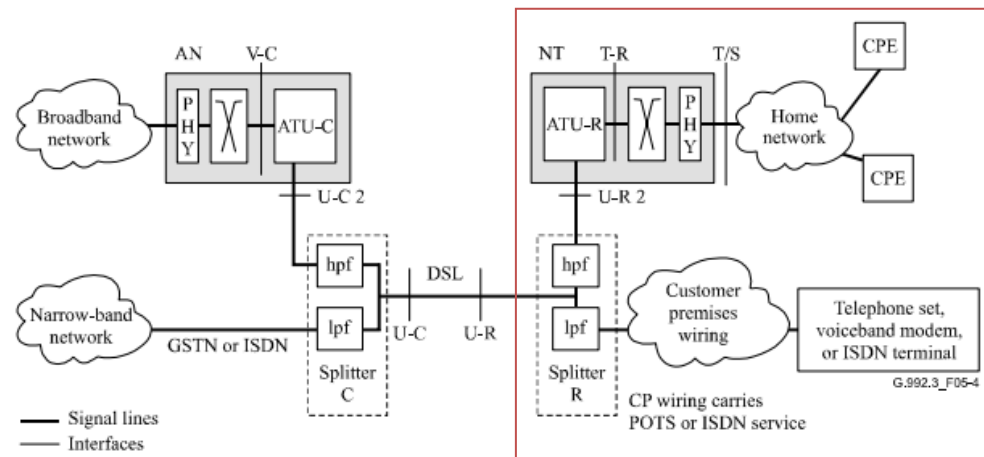
For example, the ATU-C removes the upstream data from an upstream channel and sends it to the DSLAM. The DSLAM formats the data and transmits it to the broadband network. A splitter is integrated into ATU, physically separated from the ATU and/or divided between high pass and low pass, with the low pass function physically separated from the ATU. The splitter divides the formatted signal into low frequencies for voice (POTS) and high frequencies for data (ADSL).

8.13.1.2 Transparency to methods for separating upstream and downstream signals

Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105



Source:

https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 12

8.13.1.2 Transparency to methods for separating upstream and downstream signals

Manufacturers may choose to implement this Recommendation using either frequency-division-multiplexing (FDM) or echo cancelling (EC) to separate upstream and downstream signals. The initialization procedure described here ensures compatibility between these different implementations by specifying all upstream and downstream control signals to be in the appropriate, but narrower, frequency bands that would be used by an FDM transceiver, and by defining a time period during which an echo cancelled transceiver can train its echo canceller.

8.13.1.3 Implementation of service options for ADSL

The initialization procedure described here is applicable to different service options. The subcarrier frequencies used for some signals vary depending upon whether the ADSL service is offered over a POTS or an ISDN service (as defined in Appendices I, II, or III/G.961 [1]) or as all-digital mode without underlying service. These subcarrier frequencies are, therefore, defined over a wide enough frequency band, such that the receiver can identify the transmitter state/signal, irrespective of the service option chosen.

Source:

https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-G.992.3-200501-S!!PDF-E&type=items, page 105

List of References

1. Transmission Systems and Media, Digital Systems and Networks, ITU Standard,
https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.992.3-200501-S!!PDF-E&type=items
2. AT&T website, <https://www.google.com/url?q=https://community.arubanetworks.com/aruba/attachments/aruba/unified-wired-wireless-access/26009/1/Motorola%2520NVG589%2520VDSL2%2520Gateway.pdf&sa=D&source=hangouts&ust=1530699823635000&usg=AFQjCNEMZDA-G0UNmldedGZvgZS1TVYTKg>
3. U Verse Pace 5031 NV datasheet
<https://www.dslreports.com/r0/download/2229779~b03da298d2aad3a62ba3ec53b57d8f9d/5031NV%20Data%20Sheet.pdf>